

United States Environmental Protection Agency Washington, DC 20460				Work Assignment Number: 024 <input checked="" type="radio"/> Original <input type="radio"/> Amendment				
Work Assignment								
Contract Number: EP-C-09-027		Contract Period Base: 4/1/09 - 3/31/09 Option Period No.		SF Site Name:				
Title of Work Assignment: Improving EPA's CUE Cost Model								
Suggested Source: ARCADIS				Specify Section & Paragraph of Contract SOW:				
Purpose: <input checked="" type="radio"/> Work Assignment Initiation <input type="radio"/> Work Assignment Close-Out <input type="radio"/> Work Assignment Amendment <input type="radio"/> Incremental Funding <input type="radio"/> Work Plan Approval				Period of Performance From: To: 4/1/09 - 3/31/09				
Comments: See attached Statement of Work.				QA Category (check one) <input type="radio"/> I Enforcement <input type="radio"/> II Standard Setting <input type="radio"/> III Technology Development <input type="radio"/> IV Proof of Concept <input type="radio"/> N/A				
Note: To report additional accounting and appropriations data use EPA Form 1900-69A.								
SFO 22 <input type="checkbox"/> Superfund (Max 2) Non-Superfund								
Accounting and Appropriations Data								
DCN (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount	Sites/Project (Max 8)	Cost Org/Code (Max 7)
1								
2								
3								
4								
5								
Authorized Work Assignment Ceiling								
Contract Period:			Cost/Fee			LOE		
Previously Approved			New			0		
This Action						2340		
Total						2340		
Work Plan / Cost Estimate Approvals								
Contractor WP Dated:			Cost/Fee:			LOE:		
Cumulative Approved:			Cost/Fee:			LOE:		
Work Assignment Manager Name <i>William Yelverton</i> (Signature)			3/9/2009 (Date)			Branch / Mail Code APT8; APTB / E305-01; E305-01 Phone Number (919) 541-9737; (919) 541-9456 Fax Number		
Branch Chief Name <i>Robert E. Hall, Chief. APTB</i> (Signature)			3/11/09 (Date)			Branch/Mail Code APT8; APTB / E305-01; E305-01 Phone Number (919) 541-2477; (919) 541-2477 Fax Number		
Project Officer Name <i>Diore L. Price</i> (Signature)			3/30/09 (Date)			Branch/Mail Code / Phone Number 919-541-2708 Fax Number 919-541-1536		
Contracting Official Name <i>Reita Tyus</i> (Signature)			3/31/09 (Date)			Branch/Mail Code CP08 Phone Number 513-487-2094 Fax Number 513-487-2109		
Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)						Date		

Work shall not begin until 4/1/09

**Statement of Work
For
WA 0-24
Improving EPA's CUECost Model**

Coal Utility Environmental Cost (CUECost) is an engineering economic decision support tool developed by the EPA which can be used for estimating cost of air pollution control on coal-fired utility boilers. CUECost is an Excel based tool, which provides budgetary rough-order-of-magnitude (ROM) or "desktop" engineering cost estimates for installing additional pollution controls on existing pulverized coal-fired power plant boilers, larger than 100MW in size. The current version of CUECost includes an array of combustion modification and end-of-pipe control technologies for reducing SO₂, NO_x, PM, and mercury (Hg) emissions. Recent upgrades to CUECost have built "learning-by-doing" or endogenous technological learning into the model to enable analysts to capture the impact of learning on the future cost of controls. Various utility boiler specific parameters such as firing type, boiler size, existing controls, and coal-type can be specified to estimate retrofit cost of controls for a particular boiler. Policy makers, analysts and energy modelers can use it to analyze cost-effectiveness of various options to install criteria air pollution control equipment on existing utility boilers.

The latest version of the CUECost (version 5.0) expands the model's previous capabilities to include advanced coal-fired power generation technologies such as supercritical and ultra-supercritical boilers, oxy-fuel combustion, integrated gasification combined cycle (IGCC) plants, and end-of-pipe CO₂ capture technologies such as the amine process. The User's Manual accompanying CUECost has also been updated to reflect these changes.

In preparation for public release and further development of CUECost, the contractor shall perform the following tasks:

Task 1. The contractor shall work to verify and refine model data regarding Research Triangle Institute's (RTI) dry solid sorbent process, and pollution controls for controls for IGCC plants. Completion of this task shall be communicated in the form of a technical memorandum to the WAM.

Task 2. Upon completion of Task 1 the contractor shall assist in identifying appropriate industry models and published data sources against which to calibrate the latest version of CUECost. The contractor shall then calibrate CUECost in accordance with data acquired from these sources. Successful calibration will be achieved when returned values are within +/- 30% of those predicted by other the identified sources, and the work completed shall be documented in a technical memorandum to the WAM.

Task 3. The contractor shall assist in identifying appropriate experts and stakeholders to "beta test" and review the model and accompanying user's manual. The results of this

search shall be presented, discussed and approved in a meeting attended by the WAM and other selected EPA personnel.

Task 4. The contractor shall complete the preparation and mailing of materials to the selected reviewers/testers. EPA will provide the contractor with the updated version of the CUECost workbook and accompanying user's manual, as well as the conditions for one "test case". All reviewers/testers shall be requested to first run the "test case" and to report the results to ensure integrity of their copy of the model.

Task 5. The contractor shall collect written feedback from each reviewer within one month of mailing of the review material. The feedback shall include:

- a. The results of the "test case" (as previously described)
- b. An evaluation of the results produced by CUECost, for various combinations of controls and boiler options.
- c. Any inconsistencies or bugs found by the reviewers/testers.
- d. Any other comment which may aid eventual release of the model and its documentation.

This information shall be documented in written report to the WAM.

Task 6. The contractor shall organize a conference call between the WAM and other relevant personnel and the reviewers. The purpose of this call will be to discuss the review, response to reviewer's comments, and to receive oral feed back of the testing of CUECost. Within one week after the conference call the contractor shall prepare, and submit to the WAM, a written summary of the comments and discussion from the conference call.

Task 7. The contractor shall assist with the development of an EPA report of subject matter to be predetermined at a later date by the WAM, other EPA personnel, and contractor support. This report will utilize the CUECost "beta version" under review. The development of this report will likely result in future publications and presentations for which some travel, with prior approval, may be involved.

Task 8. The contractor shall utilize the most recent version of CUECost as a platform for future development of a model version designed for a specific industrial sector (i.e. Pulp & Paper, Iron & Steel, Refineries, etc.) to be selected by the WAM and other relevant personnel. A literature survey shall be conducted to identify the technical and economic data required to develop such a model. Attendance at relevant technical meetings, symposiums, workshops, etc. may be necessary to accumulate desired information, thus some travel, with prior approval, may be involved. This information, along with a suggested plan of action for development of the new model, shall be communicated to the WAM in a technical memorandum.

Task 9. Upon approval of the development plan, a "beta version" of the new sector version of CUECost (of name to be determined at a later date) shall be developed. The progress of this task shall be communicated to the WAM and relevant personnel in – at minimum - monthly meeting updates. Any travel to relevant technical meetings,

workshops, etc. may be beneficial to the completion of this task and may be involved with prior approval. The completed version shall be presented to the WAM and other relevant personnel for review.

The contractor shall perform the activities described in the above mentioned tasks in accordance with the QAPP entitled "Improving EPA's CUECost Model", dated 3/11/2008. If the scope of work has changed significantly from that described in the ARCADIS Work Assignment 4-25, the contractor shall revise the QAPP and work involving environmental data shall not commence until it has received official approval from the EPA Quality Assurance Staff. The contractor shall comply with all requirements as delineated on the "Quality Assurance Review Form" included with this extramural action.

Deliverables

Task 1	Technical Memorandum	April 30, 2009
Task 2	Technical Memorandum	May 29, 2009
Task 3	Discussion Meeting	June 12, 2009
Task 4	Review Materials Mailed	June 26, 2009
Task 5	Written Report	August 7, 2009
Task 6	Conference Call Summary	August 21, 2009
Task 7	EPA Report	August 28, 2009
Task 8	Technical Memorandum	October 31, 2009
Task 9	CUECost Sector "Beta" Version	February 15, 2010